In an alternative embodiment, in which edge information is the only information used in the matching correlation, the intensity images are replaced with sum-of-derivatives images. To date, this embodiment has provided less favorable motion compensation than the other embodiment. However, the sum-of derivatives approach appears to provide better identification of sudden or gross motion.

While the invention has been particularly shown and described with reference to specific preferred embodiments, it should be understood by those skilled in the art that various changes in form and detail may be made therein without departing from the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. A method for monitoring effects of chemical agents on a sample, the method comprising the steps of:

dispensing a plurality of chemical agents on a sample, wherein said chemical agents interact to alter an optical signal produced by said sample, and

measuring said altered optical signal.

2. The method of claim 1, wherein said chemical agents interact to produce an additive effect on said optical signal.

3. The method of claim 1, wherein said chemical agents interact to reduce an intensity of said optical signal.

4. The method of claim 1, wherein said optical signal is a light spectrum.

5. The method of claim 4, wherein said light spectrum is a fluorescent spectrum.

6. The method of claim 1, wherein said optical signal is produced by an endogenous chromophore.

7. The method of claim 6, wherein said endogenous chromophore is a flourophore.

8. The method of claim 1, wherein said chemical agents are selected from the group consisting of acetic acid, formic acid, propionic acid, butyric acid, Lugol's iodine, Shiller's iodine, methylene blue, toluidine blue, and indigo carmine.

9. The method of claim 1, wherein said plurality of chemical agents are dispensed substantially simultaneously.

10. The method of claim 1, wherein said chemical agents are dispensed sequentially.

11. The method of claim 1, wherein said optical signal is measured over a predetermined time.

12. The method of claim 1, wherein at least one member of said plurality of chemical agents alters pH of said sample.

13. The method of claim 1, wherein at least one member of said plurality is selected from the group consisting of osmotic agents and ionic agents.

14. A method for monitoring effects of chemical agents on a sample, the method comprising the steps of:

dispensing a chemical agent on a sample, and

measuring a change in response to said chemical agent in an optical signal from an endogenous chromophore in said sample.

15. The method of claim 14, wherein said endogenous chromophore is a flourophore.

16. A method for monitoring effects of a chemical agent on a sample, the method comprising the steps of:

dispensing a chemical agent on a sample,

providing an automated triggering signal to initiate a measurement period relative to said dispensing step, and

measuring a temporal evolution of an optical signal observed from said sample during said measurement period.

17. The method of claim 16, wherein said triggering signal is provided substantially simultaneously with said dispensing step.

18. The method of claim 16, wherein said triggering signal is provided after said dispensing step.

19. The method of claim 16, wherein said measuring step comprises measuring said temporal evolution at at least one predetermined time relative to said triggering signal.

20. The method of claim 1 or 16, wherein said dispensing step comprises dispensing said chemical agent or agents as a mist in a predefined pattern on said tissue.

21. The method of claim 20, wherein said pattern is substantially circular.

22. The method of claim 20, wherein said pattern is substantially annular.

23. The method of claim 20, wherein said mist is a controlled volume.

24. The method of claim 20, wherein said dispensing occurs at a controlled rate.

25. A method for monitoring the effects of a chemical agent on a sample, the method comprising the steps of:

dispensing a chemical agent on a sample,

capturing a plurality of sequential images of said sample during a measurement period,

automatically aligning a subset of said plurality of images to spatially correlate said subset, and

measuring a temporal evolution of an optical signal from said subset of spatially correlated images.

26. The method of claim 25, wherein said aligning step comprises aligning said subset to compensate for relative motion between said sample and an optical device.

27. The method of claim 25, wherein said aligning step comprises aligning said subset to compensate for relative motion between a first portion of said sample and a second portion of said sample.

28. The method of claim 25, wherein said measuring step is performed at predetermined times relative to said dispensing step.

29. The method of claim 25, wherein said sample is selected from the group consisting of cervical tissue, skin, colorectal tissue, and gastric tissue.

30. The method of claim 1, wherein said optical signal is approximated by a decay function.

31. The method of claim 6 or 14, wherein said endogenous molecule is selected from the group consisting of NADH, collagen, elastin, flavins, hemoglobin, and porphyrins.

32. The method of claim 4, wherein said spectrum is produced at least in part by light scattering properties of said tissue.